

| Institute of Biomatics and Applied Artificial Intelligence |                      |          | Weekly hours:   |   |     |     |     |  |  |  |  |  |
|--|----------------------|----------|-----------------|---|-----|-----|-----|--|--|--|--|--|
| Name of the subject:                                       | Code of the subject: | Credits: |                 |   | lec | sem | lab |  |  |  |  |  |
| <b>Basics of Information Systems</b>                       | NIXBI1EBNE           | 4        | full-time       | 2 |     |     |     |  |  |  |  |  |
| Responsible person for the subject:                        |                      |          | Classification: |   |     |     |     |  |  |  |  |  |
| Subject lecturer(s): Dr. Kósi Krisztián                    |                      |          |                 |   |     |     |     |  |  |  |  |  |
| Prerequisites:   |                      |          |                 |   |     |     |     |  |  |  |  |  |
| Way of the assessment:                                     | Midterm grade        |          |                 |   |     |     |     |  |  |  |  |  |

### Course description

|                     |  |
|---------------------|--|
| Goal:               | Presentation of the most important factors and theoretical concepts of the emergence, and development of information technology. The subject and place of information technology in the sciences. The basic concepts of information theory. The basic concepts of encoding. Interpretation of minimum redundancy codes, major coding algorithms. The dictionary-based data compression principle, the algorithms of the most commonly used code systems. The principle and significance of adaptive encoding. The principle of fault tolerance and error correction systems. The practical part will be organized as concerted lectures, in which representatives of the Faculty or industrial companies will present the actual results of a field of information technology. |
| Course description: | Concept of informatics. Emergence, development trends. Basic concepts of informatics. Concept and amount of information. Concept of entropy. Search theory. Concept of redundancy. Encoding process. Code tree. Prefix code. Statistics-based data compression. Dictionary-based data compression. Number systems. Conversion between number systems. Numeric, alphanumeric codes. Binary representation of integer and real numbers. Basics of fault tolerant systems. Error detecting and correcting. Soft computing techniques.   |

### Lecture schedule

| Education week | Topic   |
|----------------|---|
| 1.             | Concept of informatics. Emergence, development trends. Basic concepts of informatics. |
| 2.             | Concept and amount of information. Number systems.                                    |
| 3.             | Conversion between number systems.  |
| 4.             | Binary representation of integer and real numbers.                                    |
| 5.             | Byte orders. Numeric, alphanumeric codes.   |
| 6.             | Concept of entropy. Search theory. Concept of redundancy.                             |
| 7.             | Encoding process. Code tree. Prefix code.   |
| 8.             | Variable code length. Statistics-based data compression I.                            |
| 9.             | Statistics-based data compression II.   |
| 10.            | Dictionary-based data compression.  |
| 11.            | Basics of fault tolerant systems. Error detecting and correcting.                     |
| 12.            | Numerical computing techniques.   |
| 13.            | Test  |
| 14.            | Retake test.  |

### Mid-term requirements

|   |  |
|---|--|
| Conditions for obtaining a mid-term grade/signature | Signature is denied in the case if the absence is more than 30% of the lessons, or didn't write all the midterms. The worst can be retaken in the last week. Based on the average of the tests the final grade is calculated |
|---|--|

as follows:

| Achieved result | Grade            |
|-----------------|------------------|
| 89%-100%        | excellent (5)    |
| 76%-88<%        | good (4)         |
| 63%-75<%        | average (3)      |
| 51%-62<%        | satisfactory (2) |
| 0%-50<%         | failed (1)       |

#### Assessment schedule

| Education week | Topic  |
|----------------|--------|
| 13             | Test   |
| 14             | Retake |

**Method used to calculate the *mid-term grade*** (to be filled out only for subjects with mid-term grades)

**Based on the average of the tests**

#### Type of the replacement

Type of the replacement of written test/mid-term grade/signature **At the last week, the worst midterm can be retaken. 14th week, Retake the worst test, If the grade is faild (1), and the signature was not deined, can be a take a signature retake exam.**

#### Type of the exam (to be filled out only for subjects with exams)

#### Calculation of the exam mark (to be filled only for subjects with exams)

Final grade calculation methods:

#### References

Obligatory:

Recommended:

Other references: